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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/810,871 | 03/16/2001 | Benjamin N. Eldridge | P70-US | 7472 |
| 50905 | 7590 | 05/30/2006 | EXAMINER | |
| N. KENNETH BURRSTON KIRTON & MCCONKIE P.O. BOX 45120 SALT LAKE CITY, UT 84145-0120 | | | GILMAN, ALEXANDER | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2833 | |

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/810,871 | ELDRIDGE ET AL. | |
| | Examiner | Art Unit | |
| | Alexander D. Gilman | 2833 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-58 and 60-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-58 and 60-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/01/02; 01/28/02</u> | 6) <input type="checkbox"/> Other: <u>See Continuation Sheet</u> . |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 36 and dependent claims from cl. 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 36 recites "wherein application of a pressure to said second surface of said contactor brings about electrical connections between ones of said first plurality of terminals on said contractor and ones of a second plurality of terminals on said electronic device through ones of said first plurality and second plurality of contact elements."

If the statement is related to vertical movement of the contactor toward the wafer (as it follows from the arguments filed 02/08/2006), the mechanism claimed contradicts with the specification. According to the specification (paragraph 0022) the wafer 1012 moves toward the contactor 1010.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 58, 60-74, and 76-78, 84-89 are as they can be understood due to the 112 problem, rejected under 35 U.S.C. 102(b) as being anticipated by Eldridge et al (US Pat. No. 5,974,662).

With regard to claims 58 and 76-78, 84- 89 Eldridge et al (US Pat. No. 5,974,662 disclose an assembly comprising:
a contactor (502);
an interposer substrate (r.n. 506 and col. 27, lines 64-67) having first and second opposite sides with a first set of resilient contact elements (514) on the first side and the second set of resilient contact elements (524).

a base (not shown) supporting the semiconductor device (508) comprising a wafer with a plurality of unsingulated dice (col. 1, lines 32-38) .

With regard to claims 60-74, Eldridge et al (US Pat. No. 5,974,662) disclose all of the limitations as respectively applied to claims 37,39,41-49, 51-54 below.

2. Claims 58, 76-78 and 80, 81, 84-89 are rejected under 35 U.S.C. 102(e) as being anticipated by Parrish.

With regard to claims 58, 76-78, 80, 81, 84-89, Parrish (US Pat. No. 6,215,320) discloses an assembly comprising:
a contactor (30);
an interposer substrate (36) having first and second opposite sides with a first set of resilient contact elements on the first side and the second set of resilient contact elements
a base (28) supporting the semiconductor device (26) comprising a wafer

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means (34) for securing said interposer with respect to said contactor such that at least one of said contactor or said interposer is moveable between a first position and a second position. wherein in said first position. said first plurality of contact elements do not contact said first terminals on said contactor. And in said second position. said first plurality of contact elements contact said first terminals on said contactor and said first plurality of contact elements and said second plurality of contact elements provide electrical connections from said first terminals on said contactor to a second plurality of terminals on said electronic device.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 36, 39-57 and 75 are rejected under 35 U.S.C. 102(b) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) in view of Sano.

With regard to claims 36, 43, 48 Eldridge et al (US Pat. No. 5,974,662) disclose an assembly comprising:

a contactor (502);

an interposer substrate (504) having first and second opposite sides with a first set of resilient contact elements on the first side and the second set of resilient contact elements

a base (not shown) supporting the semiconductor device (508).

Eldridge et al (US Pat. No. 5,974,662) do not disclose:

a flexible substrate of the contactor.

Sano (US 5,703,494) discloses (Fig. 6) a flexible substrate (40) of the contactor.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Eldridge et al contactor with a flexible substrate, as taught by Sano, to assure sufficient and balanced electrical contact (Eldridge, col. 2, lines 6-9).

With regard to claims 39, 40, 61, Eldridge et al disclose the contact elements comprise a cantiliver beam

With regard to claims 41, 62, Eldridge et al disclose the resilient contact structures are offset in position from said second set of resilient contacts structures (Fig. 4, col. 28, lines 24-34).

With regard to claims 43-47, 65-68, Eldridge et al disclose the electronic devices disposed on the substrate (col. 28, lines 44-46).

With regard to claims 51-57, 75, Eldridge et al disclose that contactor comprising integrated circuits for testing semiconductor device including a wafer or plurality of singulated dices.

2. Claims 37, 38, 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) and Eldridge et al (US Pat. No. 6,184,053) Eldridge et al (US Pat. No. 5,974,662) disclose all of the limitations except for the resilient contact structures formed lithographically .

Eldridge et al (US Pat. No. 6,184,053) disclose the resilient contact structures, comprise a cantiliver beams and are formed lithographically (col. 3, lines 6-11).

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Eldridge et al (US Pat. No. 5,974,662) interposer with the resilient contact structures formed lithographically as taught by Eldridge et al (US Pat. No. 6,184,053), to precisely dispose the contacts

3. Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) and further in view of Khandros et al.

Eldridge et al (US Pat. No. 5,974,662) discloses all of the limitations except for the overtravel stops.

Khandros et al (US Pat. No. 6,064,213) disclose the overtravel stops (114).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Loranger et al - Eldridge et al (US Pat. No. 5,974,662) with the overtravel stops as taught by Khandros et al (US Pat. No. 6,064,213), to control the travel length of the resilient contacts during the test.

4. Claims 42 and 63 rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) and further in view of Brozowski et al.

Loranger et al - Eldridge et al (US Pat. No. 5,974,662) discloses all of the limitations except for the flexible substrate.

Brozowski et al (Electronic Packaging & Interconnection Handbook, McGraw-Hill, 1997, Ch. 8) disclose (p. 8-5) the flexible substrate.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Loranger et al - Eldridge et al (US Pat. No. 5,974,662) with the flexible substrate, as taught by Brozowski et al, to improve alignment of the mating contacts..

Response to Arguments

Applicant's arguments filed 02/08/2006 have been fully considered but they are not persuasive.

With regard to claim 36, Applicants argue that no motivation or suggestion to modify Eldridge with Sano's flexible contactor to achieve reliable pressure connections, since

A/ Eldridge et al do not list (col. 2, lines 6-10) a flexible contactor as a parameter affecting reliable pressure;

B/ Replacement of the Eldridge's probe card 502 with a flexible card will weaken an electrical contacts in the probe card assembly since the flexible probe card would be flexed downward by spring forces in interconnection elements 516, 514.

However, as for argument A, according to Eldridge parameters affecting reliable pressure "not limited" to the factors listed,

According to the current specification a flexibility of the substrate is not critical for the invention (section 0023)- conformal or flexible substrates can be tested.

Regarding to the flexible probe card would be flexed downward by spring forces in interconnection elements, it is respectfully submitted that elastic rigidity of the contacts should be substantially lower than the rigidity of the substrate. The contacts contribute to a local flexibility, while flexible substrate affect a global flexibility.

Also, with regard to claims 36, 58, 84, Applicants argue that the prior art does not teach the vertical movement of the contactor but the vertical movement of the wafer.

However, the specification (section 0022) suggests the vertical movement of the wafer.

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If "bring about electrical connections" means an adjustment of the connection, Eldridge et al disclose that mechanism (a planarizer) as presented in Fig. 5, where an actuator being connected to the probe card.

Parrish discloses the same mechanism (col. 3, lines 17-29).

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander D. Gilman whose telephone number is 571 272-2004. The examiner can normally be reached on Monday-Friday, 10:30 a.m. - 8:00 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571 272-2800 ext. 33. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

05/24/06



**ALEXANDER GILMAN
PRIMARY EXAMINER**

Continuation of Attachment(s) 6). Other: IDS 11/17/04;11/22/04 4/02/04;3/29/04; 05/0503.